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GEOGRAPHY OF THE UNITED STATES SOYBEAN-OIL INDUSTRY

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DEVELOPMENT OF UNITED STATES SOYBEAN INDUSTRY

The soybean today ranks second only to the cottonseed as a domestic source of vegetable-oil in the United States. (Table I.) This outstanding position is of very recent occurrence, however. The bean was introduced into America during the early years of last century, but its culture was retarded for over one-hundred years by lack of knowledge concerning the cultivation of the crop

TABLE I

United States Production of Vegetable-Oils From Domestic Oil-Yielding Seeds, 1938

Cottonseed oil	1,678,000,000	pounds
Soybean oil	323,000,000	"
Linseed oil	157,000,000	"
Corn oil	137,000,000	"
Peanut oil	78,000,000	"
Olive oil	5,000,000	"
Tung oil	2,000,000	"

Source: United States Department of Commerce, 1939.

as well as lack of acute need for its production. Oats, whose place the bean is now taking in the Corn Belt cropping system, fitted well into the needs of a farm and industrial economy powered by livestock, domestic demands for vegetable-oils were more than satisfied by yields of American cottonseed and linseed oils, and soil-depletion was an unheeded evil as virgin lands were continually falling under the plow.

Added attention was given the soybean during the early years of the present century, but it was only in the post World War period that its cultivation became widespread in the United States. Even then, the bean was almost exclusively grown as a forage crop, and

a negligible part of the acreage was harvested for crushing purposes. It has only been since 1930 that the United States soybean production has truly come into its own as a source of oil. In the short span of ten years following 1930, the rise of this oil-yielding crop in America has been little short of phenomenal. This great increase has been due in large part to recent high tariff walls that were erected against imports of Manchurian soybean products, to insufficient supplies of competing domestic oils and fats such as lard, cottonseed oil, and flaxseed oil, and to growing farmer interest in crops that are drought-resistant and will maintain or increase soil fertility (the soybean is a legume and, if the seeds alone are harvested, significant quantities of nitrogen are added to the soil). Hence, whereas

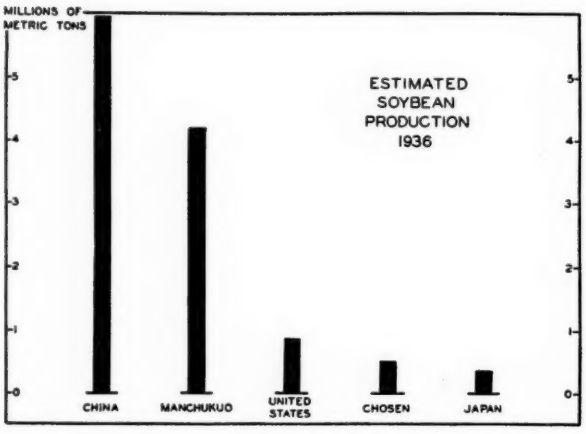

Fig. 1: Soybean production in the United States is increasing far more rapidly than in any other country. In 1924-28 the United States accounted for only 3 per cent of the total world production (excluding China); by 1936 this figure had increased to 13 per cent. Data for China have been available only during the last few years and are unreliable. (Source: International Institute of Agriculture, 1939.)

TABLE II

United States Acreage and Production of Soybeans, 1924 to 1938

Year	Total Acreage	Acreage Harvested for Beans*	Total Production Beans (bushels)	Beans Crushed (bushels)†	Per Cent Total Production Crushed
1924	1,782,000	448,000	4,947,000	307,000	6.2
1926	2,127,000	466,000	5,239,000	335,000	6.4
1928	2,439,000	579,000	7,880,000	882,000	11.2
1930	3,387,000	1,008,000	13,471,000	4,069,000	30.2
1932	4,049,000	977,000	14,975,000	5,920,000	39.5
1934	5,994,000	1,539,000	23,095,000	9,124,000	39.5
1936	6,646,000	2,132,000	29,983,000	20,619,000	68.8
1938	7,789,000	2,898,000	57,665,000	48,886,000	84.8

* The remaining acreage is used for hay or forage purposes.
† Includes small quantities of beans exported during certain years since 1931.
Source: United States Bureau of the Census, 1939.

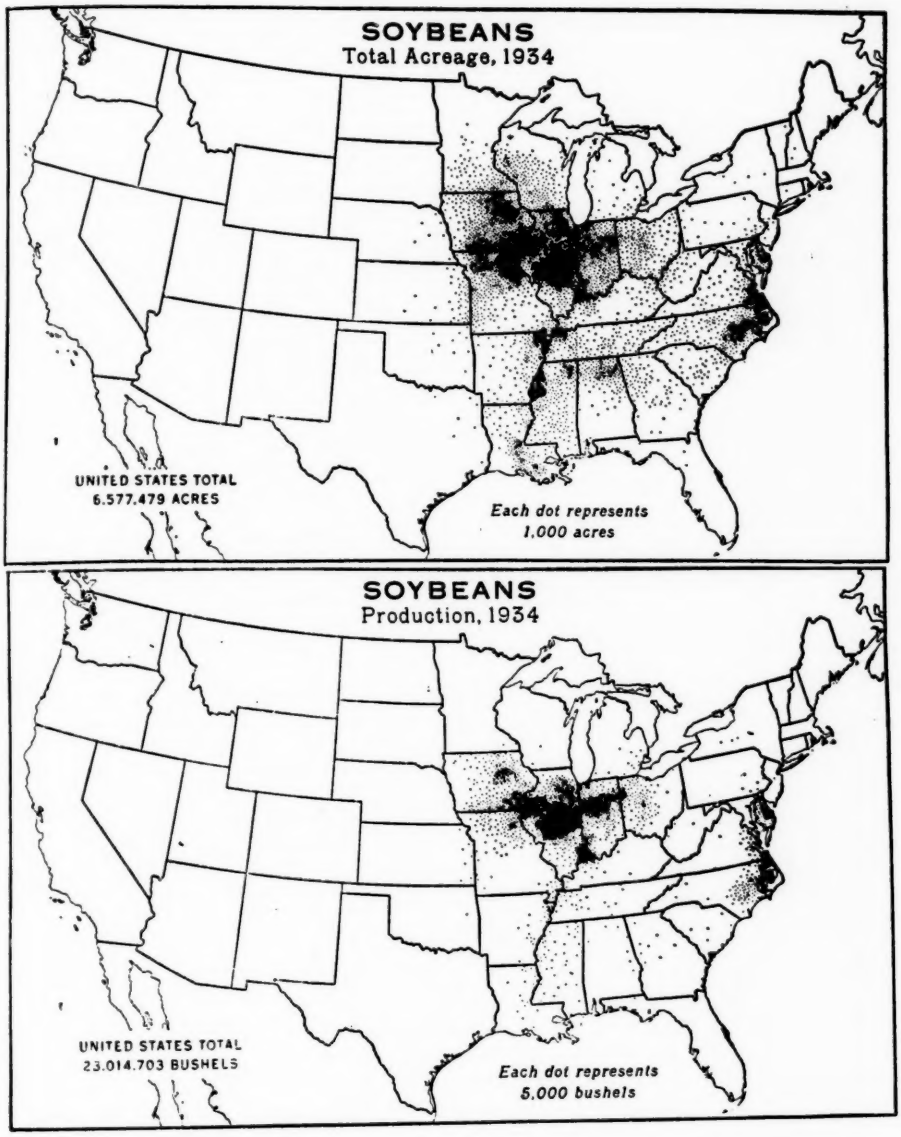

Fig. 2, a and b. Top: Soybean acreage is confined almost entirely to the eastern, humid half of the United States. Bottom: Production of soybeans for seed is centered chiefly in the Corn Belt and Middle Atlantic Coast region. The greater concentration of bean production as compared with bean acreage is shown by a comparison of these two maps. (Source: United States Department of Agriculture.)

in 1926 only 5,000,000 bushels of soybeans were harvested in the United States and only six per cent of these were crushed for oil, by 1938 over 57,000,000 bushels were harvested and eighty-five per cent of these were sent to the oil mills. (Table II.)

MAJOR AMERICAN PRODUCING AREAS

The soybean plant is quite cosmopolitan in its temperature requirements and consequently is widely grown thruout most of the humid eastern half of the United States. Acreage is large in both northern and southern states. (Figure 2a.) The major *bean-producing* areas, however, are much more restricted. Over ninety per cent of the soybeans harvested for seed in the United States in 1938 came from two centers: (1) the Corn Belt states, Ohio, Indiana, Illinois, Iowa, and Missouri, and (2) the region along the Atlantic Coast, from North Carolina to Delaware. (Figure 2b.) These two centers are in approximately the same latitude, but are separated from one another by the rugged lands of the Appalachian Highlands. Soybeans

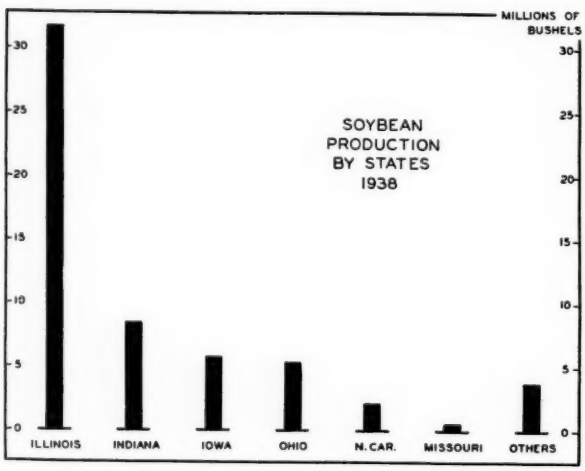

Fig. 3: A substantial proportion of the soybeans harvested in the United States does not reach the oil mills, but instead is reserved for replanting the exceptionally large acreage grown for hay or forage purposes. (Source: United States Department of Agriculture, 1939.)

TABLE III

Comparative Conditions of the Soybean Industry in Selected Regions and States of the United States, 1937

Region or State	*Total Acreage*	*Percentage*			*Yield of Beans Per Acre (bushels)*	*Total Bean Production (bushels)*
		Cut for Hay	*Hogged-Off*	*Cut for Beans*		
North-Central States*	4,623,000	51%	7%	42%	18.8	36,863,000
Southern States†	2,194,000	53%	31%	16%	10.4	3,555,000
Illinois‡	2,151,000	42%	5%	53%	20.0	22,800,000
Mississippi§	431,000	53%	36%	11%	8.5	400,000

* Includes Illinois, Indiana, Iowa, Kansas, Michigan, Missouri, Nebraska, Ohio, and Wisconsin.

† Includes Alabama, Arkansas, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia.

‡ State with leading soybean acreage in the North-Central Section.

§ State with leading soybean acreage in the Southern Section.

Source: United States Department of Agriculture, 1938.

for seed are largely absent there since they are not well adapted to lands with any appreciable degree of slope because of: (1) serious soil wash caused by the necessary frequent cultivations, and (2) the inability to use the combine for cheap harvesting in such regions.

The soybean acreage in the states both to the north and to the south of the Corn Belt and Middle Atlantic Coast is even today almost exclusively intended for hay or forage purposes, and the acreage of seed harvested is very small. (Table III.) This is partly due to the fact that among the hundreds of varieties of soybeans now found in the United States, those yielding the largest quantities of seed per acre for crushing purposes grow best under the temperature conditions existing in the latitude of the Corn Belt. Most varieties thus far adapted to the Southern States and the Hay and Dairy Region of the North-Central States are excellent hay and forage crops, but their bean yields are somewhat smaller and less desirable for crushing. Furthermore, many of the soils of the South are less fertile than those of the Corn Belt, and the price of fertilizer must be added to the cost of production if high seed yields are desired. Likewise insect and animal pests damage the soybean crop to a considerably greater extent in the warm, humid South, although soybeans planted for *hay* may be saved without applying poison by cutting them promptly when the insects first appear. This cannot be done if the crop is grown for seed and must mature. Another reason for the lack of seed production in the Southern States is the absence of suitable farm equipment. Not many of the cotton growers are in a position to handle soybeans as economically as the Corn Belt farmers, who have the grain drills and combines to enable them to produce soybean seed at lower costs.

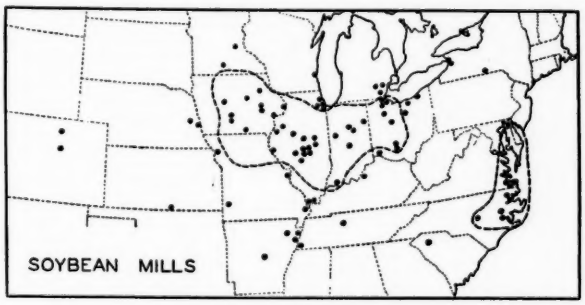

Fig. 4. Each dot represents an American mill which processes soybeans or is reported to be equipped or will be equipped for soybean crushing. The capacity and output of the individual mills vary considerably. A few mills are not shown. The dash lines encircle the major areas of soybean production for seed. (Source: United States Regional Soybean Industrial Products Laboratory, Urbana, Illinois, Nov., 1939.)

The western boundary of the "Soybean Belt" is primarily de-

termined by insufficient precipitation, since the bean requires about thirty inches of rainfall or more for best growth.

DISTRIBUTION OF AMERICAN SOYBEAN MILLS

Most of the American soybean-oil mills are distributed within or adjacent to the Corn Belt seed-producing area. A smaller group of mills is located in the Middle Atlantic Coastal seed-producing center. A few mills are found in the remaining soybean growing

TABLE IV

United States Factory Consumption of Soybean Oil, 1938

Edible Products:		
Shortening	137,133,000	pounds
Oleomargarine	39,885,000	"
Others	11,280,000	"
Inedible Products:		
Paint and Varnish	15,183,000	pounds
Soap	10,897,000	"
Linoleum and Oilcloth	3,605,000	"
Miscellaneous Products:		
Unclassified	5,399,000	pounds
Loss:		
(Including foots)	14,046,000	pounds

Source: United States Bureau of the Census, 1939.

regions to the south, the north and the west, but their supply of beans is small since the bulk of the crop in those areas is used for hay or forage. (Figure IV.)

USES OF SOYBEAN OIL

Soybean oil is the most versatile vegetable-oil in the world. When properly treated it is adapted to use in every major consuming channel for such oils. When first imported into the United States in large quantities, during the World War period, most of the oil went into the manufacture of soap. Later, when larger domestic supplies became available, the major outlet was generally the paint and drying-oils industries. Since 1935, however, the increasing demands for edible oils and the reduced supplies of lard and cottonseed oil in the United States have diverted the bulk of the greatly increased domestic production into the higher-priced edible products field. (Table IV.)

FUTURE OF UNITED STATES BEAN OIL INDUSTRY

The future of the United States soybean oil industry is problematical. Most of the product is now being consumed as a substitute for vegetable-oils that are temporarily more expensive or unavailable in sufficient quantities but are better suited to the purpose. Soybean oil is handicapped in the edible field by a tendency to acquire an unpleasant flavor on aging. Hence, it is primarily used in products that experience rapid turnover. In the paint and varnish industries it has the disadvantage of being a relatively slow dryer, and must be used in combination with rapid-drying oils such as perilla or tung before it is acceptable. In the soap industry it is higher in price than outstanding tropical soap oils such as coconut and palm. The major cause for the great increase in the use of soybean oil in the United States during recent years has been short supplies and consequent high prices of lard, cottonseed oil, and linseed oil. If and when these products once more return to normal levels of supply and price, the disadvantages of the soybean may result in decreased utilization. If, however, the bean has become firmly established in the minds of its users as something more than a temporary substitute, or if the present intensive chemical research program now being carried on with soybean products in the United States removes some of its inherent handicaps, then soybean oil will stand on its own merits and possibilities for future increase in production will be bright. In general, soybeans thrive in almost all localities where corn can be grown and consequently the acreage at present devoted to the crop in the United States could be expanded several times. Furthermore, if demand warranted, the output of beans could be expanded considerably by increasing the acreage harvested for beans and decreasing that cut for forage or hay.

TEACHING GEOGRAPHY IN 1940-41

Today Pupils Do Not Study Geography, They Live It

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THE TEACHERS PROBLEM

As school opens this fall every teacher of geography is asking, "How shall I teach Europe?" Nearly all boundaries are changed and many countries have been invaded and apparently annexed to the conquering country. But it should be very definitely recalled that boundaries and capitals constitute a very small part of real geography. It would seem that for the present there is only one solution to the teacher's problem. First teach a European country just as we have been teaching it. Then with the use of newspapers and magazines learn what has taken place in the last year or two and discuss briefly the probable significance of those changes. As yet we can only designate the region that was Belgium as Belgium, the region that was Denmark as Denmark, and so on. There are no other names. The same may be said of the countries taken over by Russia—Estonia, Latvia, and Lithuania.

All the data we have for teaching the conquered regions is the data of past years. It will be months, more likely years, before we have new and reliable information. For this reason the factual content of the geographical texts now in use—assuming that the text is reasonably modern—contains a very large part of all the teaching material that will be available for many months to come. This situation is not wholly unfortunate by any means. The knowledge of things as they have been is absolutely essential to an understanding of what is taking place at the present time and of what will take place in the future. Indeed the teacher cannot satisfactorily discuss the significance of the conquest and possible annexation of conquered territories without this background.

Obviously the physical features and resources of the conquered regions have not and will not change. Of facts relating to them we can feel sure. The value of such resources under new conditions can only be estimated on a basis of knowledge of past accomplishments. It is true that we do not know by what people or under whose guidance the resources will be developed or what part of Europe will be enriched as the result of their development. Without a knowledge of facts we cannot teach the conquered areas as they are or as they

are likely to be. Even if we could it would be a study of countries under abnormal conditions with resources unused and the whole economic structure in a state of utter confusion. What else can we do then than teach Norway, Denmark, the Netherlands, Belgium, France, and the Baltic States as they were in 1938 and the years immediately preceding? By so doing we shall give our pupils knowledge of the potentialities of those regions, the character of the native inhabitants, how they developed their resources when left free to do so, and the part which each nation normally played in the world's work and affairs.

KNOWLEDGE OF PRINCIPLES THE CHIEF OBJECTIVE

World affairs are never static. Even in times of peace geographical and economic facts are constantly changing. Facts today are not true tomorrow. The teacher's business then is not to teach such facts for their own sakes alone to be held in mind indefinitely, but rather to use as a basis for understanding how a given people react to their natural environment, the use they make of their resources, and the manner in which they carry on business with their world neighbors. Only as pupils gain such understanding are they really trained to think for themselves and in later years to interpret a world quite different from the one of which they learned in school. Is it not then our duty to teach Europe as it was as understandingly as possible with the expectation that knowledge of facts and underlying principles will enable our pupils to comprehend more fully the changes which it appears will inevitably take place in all parts of Europe and indeed in all parts of the world?

TEACHING THE NETHERLANDS

Let us take the Netherlands as an illustration to show how necessary it is to know that country *as it has been.* Holland, a little country bordering the North Sea and the English Channel, is a middleman for one of the richest and most highly industrialized parts of Europe. To the west are the greatest ocean trade routes of the world. To the east is the great industrial triangle of western Europe. Up the Rhine thru Dutch ports go raw materials and foodstuffs for the Rhine-Ruhr regions and for points farther east and farther south. Down the river thru Dutch ports go the manufactures of these same regions. The advantages of this location have made the Netherlands one of the leading commercial countries of the world. The success of the country, however, has been due in

no small measure to the Dutch people themselves. They have been explorers, daring sea fighters, and keen business men.

What of the future? Will the advantages of the past still function if these areas remain under German control? It would seem as if it could hardly be otherwise. The ports at the mouth of the Rhine will still serve the industrial regions to the east better than other ports. Indeed it is quite possible that Germany would be less likely to turn trade from these ports to Hamburg and Bremen than when the Rhine ports were held by the Dutch. The trade would, no doubt, however, be in the hands of Germans instead of under the management of Dutch traders.

Then there arises the problem of Dutch colonies. In the Caribbean are the Dutch West Indies, including Curacao and Aruba. Here are some of the largest oil refineries in the world. European and American oil companies chose these islands to refine the oil from their wells in Venezuela because the Dutch possession furnished a government more stable than that of any Latin-American country. As to the future control of these islands no one can say. Some weeks ago, a small French force was landed there to see that the islands and the oil did not pass into German hands. Since then, France has come under German control and thus the problem becomes very complicated. Neither Britain nor the United States would care to see these islands possessed by real or potential enemies.

Again in the middle east lie the Netherlands Indies or the Dutch East Indies as they were formally called. These islands produce more than fifty million barrels of petroleum and thirty thousand tons of tin each year. Other products include rubber, coffee, tobacco, tea, and rice. The islands have proved a rich possession of the Netherlands for several hundred years. Their future ownership is very much in doubt. Japan has already indicated that it would like to establish a hold there. But other countries including the United States, Germany, and Russia would no doubt offer objection to any control by Japan which would limit the trade of the Indies to that country.

FRANCE AS AN EXAMPLE

Let us look at France as it was in the early part of 1940 and in the years immediately preceding. France has long stood as a land of art and industry. Will it be able under the management of scientific Germany to produce the same type of goods of equal grade?

No one can say. We can only understand what is happening in France today and what will happen tomorrow by appreciating what the people of that country did when they were free to make use of the resources of the land in their own way. One of the great sources of French income has been its tourist trade. In so far as its buildings of historic and artistic interest are destroyed and in so far as its paintings, sculpture and other works of art are removed to other lands, will France lose the interest of the traveler and a very important source of income.

Then, too, we should know the colonial possessions of France as they stood in 1939. Such knowledge is important for two reasons: it helps to an understanding of French industry and trade; it is equally necessary to an interpretation of the industrial life of each colony. Into whose lands these colonies will fall we do not know. The few small islands on this side of the Atlantic and French Guiana will not pass into the possession of other European nations if the United States and other American countries can prevent it.

American countries are also interested in the future ownership of French African colonies bordering the Atlantic since they offer relatively easy approach by airplane to countries on the western side of the Atlantic. French Indo-China has already in some measure passed under the control of the Japanese. Such control enables Japan more completely to surround China. By doing so Japan is enabled to cut off from China any war materials that might enter that country thru the French colony. Such control also aids Japan in limiting the trade of eastern Asia to itself. Japan in French Indo-China brings it closer to India and the Malay peninsula and thus makes Japan a more dangerous military and commercial competitor. The significance of transfer of ownership of colonies can be appreciated only as we know the resources of each colony and the uses which have been made of those resources in the past.

How Study Denmark

Let us think for a moment how Denmark might best be studied at the present time. If we attempt to approach it from the standpoint of present day conditions we have no factual basis except that the country has been overrun and is now occupied by Germany. Much better than to attempt at first the study of Denmark of today is to learn what the resources of the country are and how those resources were developed by the Danish people when the great world trade routes were open.

Pupils will find that the country was very largely agricultural, and that it depended on other countries, particularly Great Britain, as markets for its eggs, butter, and meats. It also depended on other regions for grain for poultry and cattle. Great quantities of oil seeds were imported from which margerine was made for home use and from which much seed cake was obtained as cattle feed. Thru the centuries the Danes had learned that this was the most profitable use to make of the country's resources. Since the beginning of the war between Britain and Germany, the British blockade has practically cut off all importation of grain and oil seeds by Denmark. It has been necessary to slaughter cattle and poultry because feed for these animals could not be brought in. Even if the animals could be fed, Denmark's great markets are no longer open.

CONCLUSION

In citing the illustrations of the Netherlands, France, and Denmark, I have tried to show how dependent we are on the knowledge of things *as they have been* in all the European countries and their dependencies. To be sure the teacher will make all possible use of newspapers and magazines but the basic material is still in the very texts she has been using. In a very large sense those textbooks are not out of date. Indeed they contain the only textual material worth considering for months if not for some years to come. The old text must be used as it has always been. But it is very important that the study of basal facts be supplemented by a wise teacher who is thoroly informed as to what is going on and what the significance of present day revolutions is.

The pupil should live his geography. World conditions offer interest and stimulus seldom presented to the geography teacher. No teacher should think for a moment of turning from the study of European countries simply because the study offers difficulties. To a far greater extent these regions present problems which are not only world wide but which touch the life of every individual.

What has been said of texts is equally true of maps whether they be wall maps or maps in the textbooks. It will be many months, possibly years, before new boundaries and political controls are definitely established. Furthermore the war is not over; the battle is not yet lost. We can at least hope that the countries of western Europe will continue to exist as independent nations. Let us in our teaching not yield to a defeatist attitude but rather look forward to a brighter future which still lies within the range of possibilities.

EDUCATIONAL REVISION OF WALL MAPS

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The map is today the most valuable of the many visual instruments available for use in education. Nevertheless, it is in comparison to its usefulness, the most misused and neglected of the so-called "visual aids."

WHY THE MAP IS NEGLECTED

There are four principal reasons for the widespread neglect of maps by the teacher. First, their rôle in the teaching-learning process is generally misunderstood even by educational psychologists. Second, most teachers have not been trained in their proper use. Third, most people mistakenly believe that a map is something geographical in character rather than a general educational instrument. Fourth, maps themselves possess so many faults that their educational usefulness is markedly less than it should be. Indeed their faults are so serious and so nearly universal that far-reaching reforms are now imperative, particularly with regard to wall maps for the school classroom.

WHAT IS A GOOD MAP

To the expert in visual education there are only three criteria of a good map—visibility, simplicity, and usefulness of content or data. Particularly are these three qualities demanded in a wall map, which is by far the most important form of map for general school use. No map maker in America designs school maps on the basis of these three criteria. Instead, map makers have their own measures of excellence which have been handed down for generations as accumulated craft skills and trade practices, such as accuracy, typographical legibility, quality of engraving and printing, veracity of area, scale and form, and harmony of design and color.[1] These serve as armor against business competitors but they also violate or neglect nearly every essential truth of educational psychology and partially defeat most attempts at pedagogical use. Admittedly, map publishers must produce maps that the market demands, and hence part of the present situation is not wholly within their con-

[1] G. T. Renner. "Blackboard Wall Map," JOURNAL OF GEOGRAPHY, Vol. XXXIV, No. 9, Dec. 1935, p. 374.

trol. Presumably they would be pleased to publish a map that will sell.

MAP FAULTS AND SHORTCOMINGS

(a) *Maps are too small.* Wall maps of the United States, of North America, or even of the entire world no larger than 28″ by 32″ or 36″ by 44″ are frequently used in large classrooms or auditoria. Almost no world map smaller than 4′ by 8′ is worth hanging in front of an average size classroom because it cannot be read. A map is not a picture or wall decoration to be looked at. It is a page of data to be read carefully. Maps are not to convey impressions but to present legible information. No map of the United States smaller than 4′ by 7′ can be read by students even half way back in the room. We need to begin thinking about maps 5′ x 8′, 6′ x 9′, 7′ x 8′ or even 10′ x 10′ in size.

(b) *Wall maps should not have insets or small maps on their margins.* These insets are even less legible than the main map. Moreover, they use up space and compel reduction in size of the master map. They may present valuable data, but a wall map is not and cannot be an atlas. Worst of all, they often set up false concepts of space relationship and comparative magnitude in the pupils' minds.

(c) *Map elements are too small.* Fragile gossamer lines, tiny lady-like dots, and mincing well-bred outlines render wall maps as difficult to see and interpret, as a landscape shrouded in fog. Cities should be represented by big dots or discs as big as a quarter or half dollar. Rivers should be bold wide ribbons of blue, shorelines should be solid determined black lines. Names of cities should be printed in heavy lower case type half an inch or an inch in height. This will mean showing fewer cities and other items but it will insure using the ones which are shown.

(d) *The legend is almost never legible.* The legends on most maps cannot be read by even the pupils in the front row of the class. Anything which cannot be *read* near the back of the room should be left off the map. The wall map is a visual education instrument not a museum document preserving knowledge for posterity. Type, from one half to two inches in height, should be used for all legendary explanations.

(e) *Color schemes are faulty.* Political maps are particularly offensive in their use of color. Frequently they depict political areas by lurid, garish purple, orange, red, emerald green, and Prussian

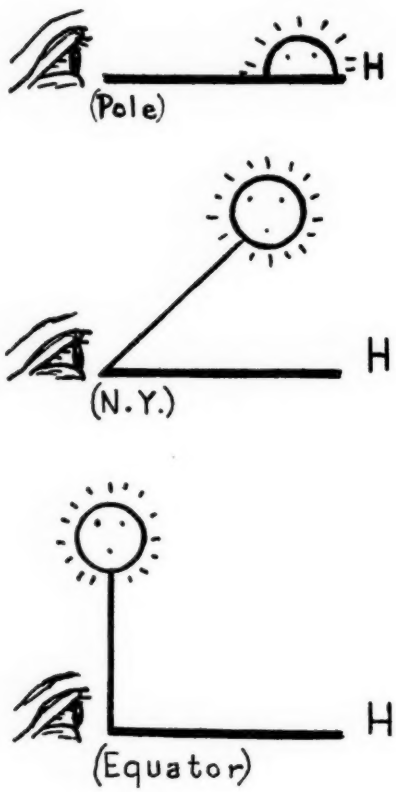
blue. Or they may delineate political areas by narrow circumferential ribbons of color. This latter device is less offensive to the eye, but it adds one more confusing set of lines to a map already full of line elements. Pale and beautiful pastel shades should be used. They differentiate the several areas as well as do primary colors, but permit other data to be almost as visible as if printed upon a white background.

In many types of maps such as those showing land surface, rainfall, population density, and so forth, colors are used to portray a scale of magnitudes or values. In all such instances, it is desirable to use a chromatic or prismatic scale of colors. Arbitrary arrangement of colors is psychologically disturbing, markedly reducing the pedagogical value of any map employing it. In certain types of maps particularly the so-called physical map, standardization of color scheme is so desirable as to be almost imperative. Harmony, unobtrusiveness, chromatic arrangement, and standardization are the cardinal criteria of map coloring.

(f) *Maps have too much on them.* Prominent publishing firms now offer for sale maps which attempt to show political areas, all important locations, hatchured representations of physical features, all major drainage lines, areas of conflicting national sovereignty, railways, airways, and water trade routes, all on the same map. Such things are not only educational enormities, they are actually pernicious, because they tempt teachers into inexcusable teaching procedures. (For instance, the writer recently witnessed at the leading model school in America the spectacle of a sixth grade demonstration teacher, glibly teaching the physical features of Mexico from a political map. In this instance the map contained a faint physical hatchuring almost obscured by the solid political coloring.) The so-called physico-political map which is a physical map with overprinted political boundaries, is almost as bad as the overloaded political map. It practically doubles the number of confusing elements presented to the eye of the child. No map can be expected to present more than one major datum unless that map be of relatively enormous size. The major objective in the matter of data is not to put more on a map but less, and to make that which is shown, more suggestively represented.

(g) *The present type of physical map possesses for the most part very little teaching value.* In most instances such maps are misnamed and do not reveal what they purport to show. They are generally called "relief" maps. Actually they show elevation, not

relief.[2] The physical relief map should be the most valuable single map in education. An elevation map on the contrary has almost no value. For instance, the fact that a human group lives on a plain is highly significant, but the fact that that plain is 980 feet above sea level or 2,120 feet above sea level usually makes almost no discoverable difference. On my so-called relief map, southeastern Iowa is colored green, central Iowa is colored yellow and northwestern Iowa is colored buff, but no Iowan knows it unless he has looked at a map. It simply makes no difference to Iowans. The fact that northern Iowa is so flat that it has to be artificially drained, whilst southern Iowa is almost as hilly as the Ozarks is not even hinted at on my map. This same map represents the extremely rugged Adirondack Mountains and extremely level western Kansas with the same color. To the school child, what must be the only logical deduction? Of course we can tell him that one is a mountainous and the other a plains region, but this is memoriter not visual education. Moreover, the visual learning in this instance flatly contradicts the auditory learning. Is it any wonder that the teacher rolls up the map before the lesson begins so as not to get into any embarrassing situations? The elevation map should be speedily thrown away. In its place a four-color map showing plains, hill country, plateaus, and mountains should be developed. Perhaps we might represent all plains by green coloring, in which case three or four shades of green could easily differentiate low, intermediate and high plains if that

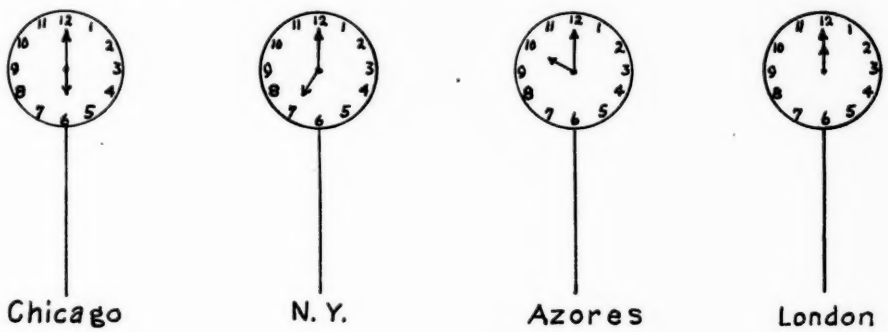


[2] The "relief-like" maps, particularly some of German and Swiss manufacture do show land relief, but it is extremely difficult for the young student to make *comparisons* in relief from them.

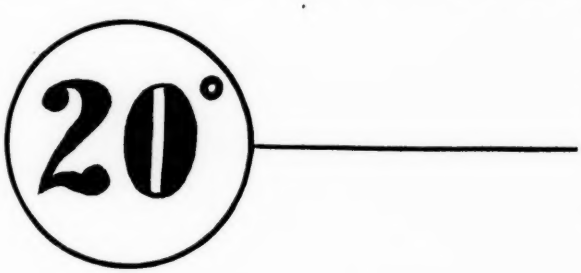
be found necessary. Similarly, three or more shades of orange might represent hilly lands at different altitudes, and so on for the other types.

(h) *Latitude expressed in terms of angular degrees is of doubtful value on a wall map.* Latitude is purely a geomatical concept, a degree being the amount of circumferential arc subtended by a central angle of one-ninetieth of an earth quadrant; a parallel of latitude being the locus of the intersection of the earth's surface and a rotating earth radius as it traces out a cone the axis of which is the earth's polar axis. This is of no interest to anyone save a scientist or a navigator. Expressions of latitude such as this should be abolished and diagrams along the sides of the map showing equinoctial noonday sun elevation above the horizon substituted.

(i) *Longitude likewise means next to nothing to the ordinary person.* The present method of expressing it on the wall should be abolished. Instead, we might well express it in terms of prime meridian time, and cartographically represent it by large black and white clock faces along the ends of the map.



On the other hand, if angular expression of latitude and longitude *must* be retained, they should be shown by large black numbers set in large white discs along the margins of the map so as to be entirely visible.



(j) *Maps showing many important data are not available to education.* Maps depicting relief, simple, easily understood climatic regions, soil types, seasonal rainfall

types,[3] temperature seasons,[4] coal fields, crops, public forests-parks-monuments and highways, regional railway systems, ethnic groups, land use, conservation information, and many other extremely valuable data are almost nonexistent. Large maps of some individual countries are not to be had. Nearly a dozen different large maps of Spain are available, but no large map of Japan or Siberia is on the market altho they are more generally needed than one of Spain.

(k) *Maps are not graded for age level.* We do not give an adult book to a child, but we do insist on giving esoteric, symbolic, highly conventionalized adult maps to children. We simply must have graded primary, elementary, and secondary school maps, if we expect to teach from and with maps.

(l) *Maps are too expensive.* A good map today ordinarily costs from three to thirty dollars. In this it is comparable to the hand tooled, hand assembled automobile which costs $5,000. American industry, however, can and does make $500 automobiles. It can and must give us 50c, $1.00, and $2.00 wall maps to be used for three or four years or less and then thrown away when worn out.

In the first place, maps do not need to be products of exquisite lithographic art. They can be quickly drawn and designed by a cartographer, a psychologist, and a subject matter specialist working together. They do not need to be backed with expensive fabric. We are already manufacturing a building paper reinforced with hairs or fibres which is so strong that it cannot be torn. Such paper can be bought in rolls four feet or more in width at a cost of a few cents per running yard. Maps do not need expensive mountings. Plain wooden or pressed steel end moulding or three metal eyelets are all that is needed.

Concluding Statement

The present educational neglect of the wall map would not be especially serious were it not that the map is an absolute essential in the teaching of most ideas in the social studies. Geography, history, and civics are not bodies of unique subject matter; they are states of mind. It must, however, be recognized that states of mind are themselves not units; they are composed of great clusters of

[3] Many maps of total annual rainfall are available, but such maps are of almost no value educationally. Semi-annual maps are more valuable but not what is needed.

[4] Isothermal line and layer maps are in common use, but they are of little value educationally.

working ideas or concepts. None of these concepts in the social studies are purely factual or textual in their nature; they are in part geometrical. That is to say, they have form, place, and extent—qualities which can be developed only thru the use of the map. Since the map is little used in education, the ideas of most people are warped, grotesque, and out of scale in their spatial aspects, no matter how accurate they may be in factual, chronological, or emotional details. Many visual educationists are, therefore, insisting upon an increased use of the map in education. Any such increased use, however, can only be predicated upon far reaching reforms in wall maps themselves.

GEOGRAPHY AS THE CORE IN UNIT OF THOUGHT TEACHING

ELIZABETH STADTLANDER
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For a number of years now, elementary teachers have felt that there was something lacking in the educative process of the intermediate grades. Children were taught the various subjects by one or several teachers. They were exposed to these different branches of knowledge during the course of a day, and yet when they were released from school, all the school subjects melted into one activity —life. Out of school a child might be sent to the store for butter, pepper, or coffee. Never once did the child think of butter as coming from the cow which might be located on a farm in Wisconsin. Therefore, the term butter did not signify something geographic to him, but rather food for his hungry little body. Neither did the money transaction symbolize arithmetic. The whole business of living, buying, and working becomes one outside of the four walls of the school room.

The assignment of specific branches of knowledges, therefore, gives a narrow view to each subject. If all facts that have to do with dates are pigeon-holed into the history field, if all facts that have to do with numbers are in the arithmetical category, if all names of places, mountains, rivers, oceans, etc., are regarded as geographical, our education becomes a system of categories, a scheme of blocks, or a planned method of logical thinking such as we never use in life situations. As a result of this plan in our educative scheme, each teacher becomes a subject matter specialist and

looks upon her field as holy ground and as being of the utmost importance in the school.

A step forward and away from the individual subjects is that method commonly known as correlation. By this means, several subjects travel along together, related to each other in as many ways as possible, but each continuing to be an integral unit of its own. In this scheme, the history of France, for example, is studied at the same time as the geography of France, altho subjects may still be taught by different teachers and, of course, will come at different times of the day. However, this method is superior to the isolated subject matter method in that the child does not have to adjust his thinking to the extent that he might have had to do if he had been studying France in geography and the Civil War in history. This method lends some unity of thought to the school day.

From correlation we have come to the stage of "fusion" or integration or unity. Regardless of terminology, this matter of unity means that the various subjects of the course of study are closely related and definitely tied together by a single problem, or unit of thought. There are no fact boundaries. All branches of knowledge necessary for the solution of the problem are acceptable in the thought unit under consideration. Arithmetic ceases to be an isolated topic of juggling numbers. Instead, it becomes a means of interpreting data concerning the crop-production, the density of population, the value of imports and exports converted into our monetary system. Spelling becomes a means of learning to write, pronounce, syllabify words or phrases that are needed to talk intelligently about a country or region. Language becomes a medium thru which the children express their thoughts about the material being studied. By thus uniting all subject matter, children are able to develop thinking, reasoning, and problem solving in one unit of thought.

CORE OF THE UNIT OF THOUGHT

Geography, however, has been called a thief by other subjects. Perhaps it is rightly called that, but what other subject leads to an understanding of the way man lives because of his natural environment? What other subject can utilize all the facts of other subjects and mold them into a single problem, topic, or unit of thought? It is granted that geographical integration is not the solution to the educative process, but considerable help lies in the fact that all branches of knowledge must be used by the geographer. Without history, he cannot explain the division of peoples in the world;

without arithmetic he cannot express the relative value of products of the world; without the language arts, he is powerless to express any ideas at all. Therefore, geography has attempted to bring within its scope the broad knowledge of a liberal education in a unified, palatable way. It is not the catch-all. *In reality, it is the melting pot of subject matter.* For example, it is impossible to discuss the Norwegian people without involving the historical fact that the people became a seafaring, venturesome folk because their country turned them out. A study of the map alone will show that these people could not be expected to travel swiftly and easily into the interior of the country when the mountains rise sheer at the coast.

Another fact that substantiates the claim that geography is well suited to be the core of a unit of thought plan is that geography concerns itself with the industry and trade of a country (Economics) the seat of civilization (History, Political Science, Sociology) the background of literature. History deals with places, but is valueless if unrelated to definite localities and their topographical and climatic conditions. To understand the history of a country, the student must have a geographic understanding of the country itself and of the neighboring countries that have influenced it. To conceive, for instance, of the amicable relations between the United States and Canada, a geographic knowledge of the fact that both countries have relatively the same products along the boundary eliminates the desire of possession of another's property for its material value. Literature deals with human nature, human life, and the background of life. All fiction has a setting. Therefore, readers of fiction enjoy stories more if they understand the topography of its setting. How much more enlightening is Hamlin Garland's *Son of the Middle Border* if the reader has a concept of the great plains of the United States.

The school offers one of the greatest services to society when it establishes favorable attitudes toward life and peoples; respect for other nations and peoples, for the skill of the French in art, for the scientific attitude of the Germans, for the craftsmanship of the Eskimo in his construction of the Kayak, for the ingenuity of the Mexican in his conception of a combination cloak and blanket—the serape; a sympathy and feeling of fellowship toward people who engage in the same types of work as our own people; a desire to understand the spirit of co-operation among men. All this is possible, if the subject matter can be molded together to form a single attack on a problem.

Difficulties to be Overcome

By making geography the core and integrating, fusing, or uniting all other subjects, there are many problems to encounter and overcome. First of all comes the criticism that teachers interested primarily in one phase of the unit of thought will stress that to the exclusion of other subjects; that is, the artistically minded teacher may dwell on the art and music of the region, the arithmetically inclined teacher will stress the arithmetical phase without consideration of the other fields included within the unit of thought. To overcome this criticism, it seems advisable to set up and keep constantly in mind the objectives and attainments which are to be sought in each field. A goal sheet of the skills, knowledges, attitudes, and appreciations to be attained during the course of a year may help the teacher to keep her pupils progressing as rapidly as is advisable. In planning a unit of thought, the aims of the major subjects may be listed for each subject as established by the course of study or a stated authority. Thereby, a teacher can consistently check her activities against the goals. By this means the criticisms of the subject-minded individuals may be met and overcome.

Another criticism which must be met is that teachers are not well enough grounded in the fundamentals of all the subjects, that the teacher's background may be limited to the extent that she cannot do justice to all subjects. Perhaps that too, is a justifiable method of reasoning. However, teachers are constantly endeavoring to improve their background by travel, reading, further study, and social activities. Schools of training are conscious of this drawback in the broad cultural training necessary for a well-rounded teacher. These schools are endeavoring to meet the requirements of the modern type of education by establishing courses of orientation, history of civilization, and surveys which lead to wide knowledge. It seems wise that the teacher should have a background of the whole geographical, historical, literary, and artistic accomplishments of the peoples about whom she is going to have her children learn. It has been proved that any teacher who is willing to accept the challenge of this unit of thought type of teaching, will also accept the challenge of acquiring the knowledge which it is essential for her to have. In truth, the teacher who will attempt this type of teaching, is the teacher who is wide-awake, stimulating to the pupils, earnest, sincere, and eager. For this reason, the various subjects may well be incorporated into a unit of thought with

geography as the core, since it is the branch of knowledge which will call forth all the other branches to its service.

UNIT OF THOUGHT ORGANIZATION

Such a unit of thought plan will require re-organization of educational thinking. It will necessitate different terminology than English, spelling, history, etc. In large categories many subjects are grouped into the humanities, the technical phases of knowledge, and business administration, etc. Why should unit of thought planning not be divided into phases also?

A method of planning such a unit of thought might entail the following phases:

1. The orientation phase
   Questions which lead into the unit of thought
   Relation of the previous thought unit to the new unit
   Picture presentation
2. The planning and evaluating phase
   The objectives to be sought
   Children's plans
3. The research phase
   The gathering of materials and information
   The location of visual aids to establish concepts
4. The building and construction phase
5. The creative phase
   The utilization of as many media as possible to develop expression
   The development of powers of reasoning
6. The appreciation phase
   The quiet of listening to and appreciating music, art, stories
   The attitudes of sympathy, respect, sincerity
7. The practice and drill phase
8. The culmination phase
   The summarizing for groups
   The presentation of exhibits, plays, demonstrations, etc.

CONCLUSION

With such phases as the basis for a unit of thought, the school life of the intermediate child becomes an integral whole, rather than a series of parts; with the geography as the core into which all other subjects will lead for their interest and reason, the thinking of the child becomes a logical pattern, instead of a multitude of confusing ideas; with one problem or topic or unit of thought as a thread, the child will no longer encounter up to twelve subjects daily, but rather have one complete thought around which to center his attention and weave his thoughts. School life then may become a more life-like situation.

TOYLAND AND GEOGRAPHY

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INTRODUCTION

Toyland still remains a rather vast unexplored continent, full of the richest possibilities. It awaits but the combination of teacher and students, intrepid souls, ready to tap its reservoir of educational opportunities. Situated 30° North by South of the Toychest, and bounded on all sides by the Imagination Ocean, it literally begs for explorers.

The dangers present are relatively few and in this continent there is only one deep pitfall which is evident to those who have intellectual eyes with which to see and think. Toys are not to be used as ends in themselves but only as means to attain a definite and realizable goal. Toys will stimulate the interest of the child and in a properly prepared lesson, will permit the child to participate actively instead of passively. The child becomes a doer, a creator in a pattern of learning which permits concrete experiences to interplay with definite units of geographic material.

The child's world meets the requirements of the adult's world at a level which the child can comprehend. Isolated facts, the bugbear of geography teaching, need no longer exist but can be blended harmoniously into definite units of teaching and achievement levels of learning, With skill on the part of the teacher, the children will feel they want to learn more geography.

As a general rule, the toys required need not be purchased by the teacher or the school. In ninty-nine cases out of a hundred, each child will rummage thru the closet for toys which are no longer needed and bring them to school. And in the one hundredth case, the necessary materials can be bought in the 5 and 10 cent store or in the neighborhood stationery store, and the units cost either 5 or 10 cents each.

Several examples will now be given to show the techniques to be used and the arrangement of the toys in teaching various parts of the courses of study in geography.

THE APPROACH

A sample approach will now be considered. The field of transportation and its many ramifications offers an excellent starting

point. The teacher can use the following technique which will convince the students that they want to use toys as a means to better understanding of the subject of geography. Procure a toy locomotive. It may be an electrical one; a mechanical one; or the small miniature metal toy locomotive that sells for ten cents. Unexpectedly show it to the students of your geography class. Appear to be very serious and act as tho you are somewhat puzzled. Examine the locomotive carefully and be certain that the eyes of your students follow every movement that you make. And if some stand up in the aisle, just be oblivious to that fact. Then begin to talk slowly and say, "One of the students has made an excellent suggestion. He has said that one can study the subject of transportation by the use of toys. Of course, we would need toy trains, autos, boats, airplanes, wagons, etc. What's your opinion?"

From then on, in the normal course of events, you will have your hands full of eager youngsters. They will volunteer to bring toys to class. Be certain to point out to them that any toys which they bring to class will be returned to them. Have a committee appointed by the students. Work together with this student committee. They will keep the names of the students who bring in the toys and give receipts for each toy, noting its description and condition. Give them closet space and a large box or several shelves so that the toys may be stored without damage to them.

In a day or two you will have a railroad station, steam locomotive, electric locomotive, all kinds of freight and passenger cars, airplanes, landing fields, searchlights, boats, rickshaws, carriages, and a variety of other toys relative to the subject of transportation.

This approach can be used in regard to any subject you may wish to teach. After a while the students will make suggestions as to future subjects which they feel could be approached by the use of toys. Give your fullest attention to these suggestions and invite ideas. With a deft hand, you can always reword a poor suggestion into a good workable one, and thus have a co-operative student instead of a sulker.

You will probably have some students in the class who can draw, paint, mould, or do carpentry or electrical work of one kind or another. They will help you build the warehouse or the freight yards. It is very important to try to plan your work so that each student may have some work to do. The various types of toy construction sets will afford ample work for the balance of the class.

PLANNING THE LESSON

The teacher who has the idea that teaching a geography lesson thru the use of toys is "easy," is just following a will-of-the-whisp fantasy. The lesson itself requires careful and detailed planning. The teacher must carefully list the main facts and ideas that the student is to acquire. The minimum is determined by the course of study and the maximum by the policy of the school.

Let us use the topic of transportation as an illustration. The syllablus may call for the teaching of the names and routes of several of the important railroads crossing the continent and key cities thru which they pass. In addition there may be required data as to the type of freight carried to and from different central points within the country. There may also be the teaching of the ideas of raw materials, finished products, and the concept that finished products may in themselves be the raw materials for other products. Then the syllabus may call for important automobile routes and the effect of auto transportation as a competitor and as an aid to railroad traffic. The problems of aviation may have to be presented in regard to passenger and freight service and in relation to other means of transportation. The use of boats on the lakes, rivers, ocean travel, and the type of freight carried will also have to be considered.

The teacher must have the general plan outlined. Then the general plan has to be considered in terms of the available toys, other available geographic materials, the room itself, and the composition of the student body. In a large room with movable chairs, the teacher can have the students draw a large outline map in chalk on the floor. If long tables are used, a large outline map of the United States can be placed upon the tables. Insofar as possible each student is to have a specific task in addition to participating generally as a member of the class in the development of the lesson.

Appoint a second committee to act in a co-ordinating capacity and to keep a list of the names of the students and the specific duties of each student. One student will be in charge of trains, another in charge of boats, another in charge of air fields, another in charge of automobiles, several will be station masters, some will be freight handlers, others will be buyers and sellers of merchandise, and there will be several secretaries to keep accounts of the proceedings.

The teacher will have to plan the lesson in conjunction with outside data to act as a check upon the lesson itself in regard to accuracy. You will be surprised, when you turn glittering generalities

into specific facts which must be backed by accurate data, to realize how much rechecking must be done. In the proper presentation of a lesson of this type, not only will the teacher ask the students questions, but there will be many questions that the students will ask of the teacher.

The students will help you procure maps showing the routes of the various railroads and airplane lines, the highways of the United States, routes taken by boat lines, freight schedules, etc.

If the policy of the school permits it, individual assignments for bright and gifted children can easily be developed. The child interested in railroad transportation might want to make wooden models—from toy kits—showing an historical display of locomotives. Another child might be given a book on the history of railroad transportation. Another child might build a clay model of the automobile highway of the future.

One lesson may lead directly to another. The problems of transportation can lead to a study of the products of this country or even can be taught in connection with the subject. From a realistic point of view, transportation does not function in vacuo, it exists only as a medium connected with people and things.

CURRENT SITUATIONS

In many cases it will be possible to use a current situation as a background pattern thru which to teach geography by the use of toys. As much as educators may deprecate war, children still find an outlet for energy and creative imagination, playing at some form of war or conquest. Regardless of whether it be cowboys and soldiers fighting Indians, Buck Rogers' imitators fighting the Martians; youthful G-Men vanquishing the racketeers; or a modern version of the blitzkrieg; children continue to play at some form of mimic warfare.

The almost crazy pace at which the map of Europe has been changing has been more than enough to cause headaches and worries to the staunchest of geography teachers. With toy soldiers, sailors, warships, transports, submarines, airplanes, tanks, armored cars, machine guns, heavy artillery, wireless sets, etc., the class is ready to duplicate any war.

Capital cities, industrial areas, farming districts, distances between countries, boundaries, climatic conditions, mountain ranges, lack of abundance of raw materials in certain countries, and the future plans of powerful nations, become realities to the children

as toy armies move over maps—correlated with newspaper reports, radio commentators, magazine articles, and motion picture news reels. No wonder that geography work takes on a new vitality! The child can actually live thru geographical as well as historical experiences, thru a blend of substitutional experiences blended cautiously with reality.

In certain cases skillful handling may be necessary to avoid creating certain prejudices if the children have to take "sides." If you want to have this world invaded by Martians or the inhabitants of some other planet, you can make use of some of the comic strips in the newspapers.

Current situations may also be used as the basis of individual or group projects. If a certain agricultural country is in the limelight, toy cows, chickens, pigs, trees and tractors can be used to show the life of the farmer in that country. Clay or cardboard farmhouses will complete the scene. Or is it a certain oriental country upon which the attention of the world is focused? Appropriate toys can depict the life in that particular country. With proper news items, pictures from the rotogravure section of the newspaper or pictures from magazines placed upon the bulletin board, the right atmosphere can be created and blended with the project itself.

TESTING THE RESULTS OF TEACHING

The students should know that they will be held responsible for the facts and ideas developed during the course of the lesson with the use of toys. Proper testing under such circumstances serves several useful functions. It will prevent some of the students from forgetting that the main purpose of the lesson is to learn geography. Not all supervisors are receptive to the idea of teaching thru the use of toys. They may feel it is "a waste of good time." If they are made to understand that tests will be given and the students will be held responsible for the portion of the course of study taught in this manner, you will be able to get consent to try this method from even the "hardest" of all supervisors. The test may show certain weak spots in the lesson or mistaken ideas that were developed and thus permit the correcting of such notions. It will also permit you to make necessary adjustments in your teaching plan for future lessons in which toys are to be used. If you make out the test as part of your lesson plan before the actual teaching of the lesson itself, it will serve the purpose of preventing you

from "going off on a tangent" during the lesson and keep you within the bounds of the lesson plan. Needless to say, you probably will have to change some of the questions themselves, after you have taught the lesson.

Use true and false questions, completion questions, alternate choice questions, essay questions, and map questions. If possible, have your test mimeographed and correct the papers as soon as possible.

THE TOY CORNER

Biologists will probably continue until domesday their dispute as to which is the more important factor in the life of a child—environment or heredity. But in the meantime, we teachers know that a proper class environment can do much to stimulate the child and help to create within himself the desire to learn. It is one of the tragedies of education that many geography teachers must teach this subject in a room ill-fitted for the best presentation of the material. You can have a toy corner—on the window sill, on a book case, on an open shelf, on the top of a packing case, on a spare desk top or table, or on a section of the floor itself. When you have finished the first lesson with toys, you will find that several of the students will ask you if you want to "keep" the toys. And thus you can start a collection of toys that will do much to brighten the teaching of geography.

In addition to toys, you will soon find that some of your students want to donate games that can be useful in the teaching of geography. Some will have geography question cards, others may have electric-quizzers, and some others may have map games.

But if these toys and games are to have any meaning that is really sound, they must be employed by the students. You will be able to plan future lessons with some of these toys. The geography games can be loaned to other students. Unfortunately the idea of the "lending toy and game library" has received too little consideration as an educational possibility in geography teaching. Students should be permitted to use these toys and games during their study period and even to take them home. Just one word of final warning. Don't get so engrossed in the toys yourself that you forget they were meant for the use of the children. Geography may be your domain, but Toyland is their Possession.

TACKLING THE EROSION PROBLEM IN HIGH SCHOOL GEOGRAPHY CLASSES

CLARE SYMONDS
Senior High School, Quincy, Illinois

That "children learn by doing" is quite generally believed to be true. Yet it is true only under certain conditions—the child must be mentally alive while he is *doing*. He learns little, if anything, by merely going thru the motions of "doing."

There is no question but that young people's mental activity is at high stage when the subject of erosion is brought up for discussion. The term seems to strike a responsive chord in their minds. They appear to delight in describing some "awfully cut up places" which they have seen. Their active minds need only wise guidance to carry out a program of study which will provide them with *facts* of wide variety and great significance to discuss in class meetings. In such a discussion youngsters seem to experience the thrill of discoverers bringing forth their trophies to amaze their fellows. Worksheets provide a tangible basis for the pupils' research. Most young high school people need the "hints" provided in this manner. Long practice is necessary to develop the ability to select and the power to evaluate information they find.

The following outline which I have found workable does not require a large library. Most of the pamphlets were obtained free of charge and we have only a few copies each of the books named in the bibliography. Working in committees may cut down the numerical requirements in reference material.

Some readers of this article may be interested in the plan of discussions which has proved successful with this topic. Before all members of the class had completed their study, some of the pupils who are able speakers assumed the responsibility of making an oral presentation to the class. The principal divisions of the topic—causes and agencies of erosion, damage done, and methods of control—were given, with illustrations projected with our opaque machine. After these talks, work on their outlines was resumed by all pupils. The better pupils enlarged their project by doing some research along various by-paths which appeared interesting to the individual.

The final "roundup" was so thoroly enjoyed that I've been besieged with inquiries as to when we can have another "panel" dis-

cussion. The six members of the panel were chosen by the officers of their class, the whole class voting as to which officer should act as panel chairman. The success of the panel type of discussion in the classroom as elsewhere depends upon the chairman. In each class at least four of the members of the panel proved to have been well chosen. I was a member of the audience and was permitted to take part under the accepted rules for such procedure.

A teacher visitor in one class handed me the following as he left. "Criticism—nice interest (youngsters seem to like it); Panel doing very well; Need more questions (wider distribution) from class—pretty good tho; Citizenship training excellent." I thought the "Panel" rated seeing his comments so I handed them over. They were thrilled that his "criticism" had been largely commendation.

In all possible ways we try to supplement our study of erosion with first-hand experiences. We cannot always have field-trip weather when we wish to go but valuable experiences are gained when we are able to go on such trips. Bad weather cannot hinder those pupils who like to take time to experiment with an erosion project in the laboratory.

The galvanized pan made for us at a local tin shop ten years ago has been the "locale" for a good many groups of "men at work." When any group constructs an unusually successful and interesting project a "hands off" sign is posted during the remainder of the semester but each semester sees a new group hard at work putting into "practice" some of their ideas of erosion control.

THE EROSION PROBLEM*

The wearing away of the land surface which we term "erosion" consists of three processes—loosening, picking up, and transporting of surface materials of the earth. Some of the same agencies which loosen the material (weathering) are also active in picking up and transporting the loosened material. Erosion has made such headway and depleted the soils of the United States to such a great extent that it has come to be one of the major problems of our nation.

The following outline will be a guide for your study of the problem. (Be sure to make a note of references used so that you will be able to defend your "facts" if they are questioned.)

* Condensed version of worksheets used in Quincy High School Geography Classes.

A. Principal causes of erosion
  I. Natural factors which favor soil erosion
    1. Climate
    2. Topography
    3. Soils
  II. Cropping practices which facilitate soil erosion
  III. Deforestation as a cause of erosion
    1. Causes of deforestation
      a. Fires
      b. Insects
      c. Wasteful logging methods
    2. Results of deforestation
    3. Remedies
      a. The Shelter Belt Project
        (1) Location
        (2) Climate
        (3) Native vegetation
        (4) Plan
        (5) Purposes and hoped-for results
        (6) Amount accomplished
        (7) Success or failure?
      b. Better forestry methods

B. Types of Erosion
  I. Sheet
  II. Gully
  III. Wind

C. Methods of control
  I. Mechanical processes
    1. Contour plowing
    2. Terracing
    3. Dams
      a. Brush
      b. Wire
      c. Concrete
  II. Cropping practices
    1. Planting crops which do not require cultivation
    2. Strip cropping
    3. Proper crop rotation
    4. Others

D. Results of erosion
  I. In the United States
  II. In Illinois
  III. Erosion and floods
    1. Principal causes of floods
      Excessive run-off
    2. Control methods
      a. Levees
        (1) Natural
        (2) Artificial
          (a) Where
          (b) Necessity for increasing height rather frequently

E. The seriousness of the problem
- I. Rate of soil formation
- II. Rate of soil destruction
- III. Soil and the farmer
  - 1. Erosion and submarginal land
  - 2. Good soil and prosperity
- IV. The concern of the national and state governments
- V. Our concern

BIBLIOGRAPHY

Books:

1. Van Hise and Havemeyer, Loomis. *Conservation of Our Natural Resources.* New York, The Macmillan Company, 1930. Pages 359-376.
2. Parkins, A. E. and Whitaker, J. R. *Our Natural Resources and Their Conservation.* New York, John Wiley and Sons, 1936. Pages 65-100.
3. Field, Richard M. *Natural Resources of the United States.* New York, Barnes and Noble, 1936. (Floods, Soil Erosion, Conservation of Forests in Summary Form.)
4. *Report of the Mississippi Valley Committee of the Public Works Administration,* Superintendent of Documents, Washington, D.C. $1.50.
5. *Reports of the National Resources Board.* Superintendent of Documents, Washington, D.C.

(The following were supplied free by our Congressmen.)

	Bulletin Nos.
6. Preventing Soil Blowing by Planting Trees.	
1) *Prevent Soil Blowing*	1771
2) *The Windbreak as a Farm Asset*	1405
3) *Tree Planting in Great Plains Region*	1312
4) *Tree Planting*	
5) *Forest Planting on Illinois Farms*	479
6) *Forest Farming*	
7) *Trees that Temper the Western Winds*	
8) *Planting and Care of Shelterbelts*	1603
9) *Possibilities of Shelterbelt Planting in the Great Plains*	
7. Methods of Erosion Control	
1) *Cover Crops for Soil Conservation*	1758
2) *Terraces to Save the Soil*	459
3) *Stop Gullies and Save Your Farm*	1737
4) *Strip Cropping to Prevent Erosion*	85
8. Soil Conservation	
1) *To Hold This Soil*	321
2) *Soil The Nation's Basic Heritage*	
3) *Index to Soil Conservation and Improvement Chart*	
9. Soil and Water Conservation	
1) *Soil and Water Conservation in Pacific Northwest*	1773
2) *Conservation Farming Practices and Flood Control*	253
3) *To Keep the Water in the Rivers and Soil on the Land*	
4) *Conserving Corn Belt Soils*	1795

10. (From Illinois State Planning Commission, 407 South Dearborn Street, Chicago.) *Report of the Illinois State Planning Commission*

NATIONAL COUNCIL GEOGRAPHY TEST

At the beginning of the new year the National Council of Geography teachers is pleased to announce publication of the first test in a series of geography tests. This test is for the fourth grade and was prepared by Professor Zoe Thralls, University of Pittsburgh and Dr. Marguerite Uttley, Iowa State Teachers College. The National Council Committee is continuing its research and construction of other tests to appear in the series. These tests are certain to set new standards in the measurement of ability of students to interpret geographic materials.

The Fourth Grade Geography Test is constructed to measure geographic understandings and their component associations and relationships—the pupil's "geographic-mindedness." Rather than testing purely for retention of facts, this test is primarily concerned with the *use* of facts.

This fourth grade test will discover the child's ability to:

1. Obtain facts from maps, pictures and text material.
2. Select facts from his own storehouse of knowledge that are pertinent to the problem at hand.
3. To apply understandings previously mastered.

This new series of tests is being published for the National Council by McKnight & McKnight, Bloomington, Illinois. All inquiries concerning the test should be addressed to the publishers.

EDITORIAL NOTES AND NEWS

According to a release from the United States Department of Commerce, our supplies of manganese on hand or readily available are estimated to be adequate for two years' requirements; and tin, for one year's supply. Manganese is essential in the defense program for the processing of steel needed in modern warfare. Tin is needed for tinplate, solder, bearings, and other defense equipment. The Aluminum Company of America, producer of our ingot aluminum, will add three new units to its Bonneville, Washington, plant which will increase production by 90,000,000 pounds a year, and another unit to its plant at Alcoa, Tennessee. Another company is expecting to open a plant at Sheffield, Alabama. All these plants are capitalizing on nearness to cheap hydroelectric power developments. Aluminum alloy comprises more than half the structural or net weight of an airplane. Truck bodies, trains, and other transportational equipment, together with electrical conductors, heat insulators, and paints are the heavy consumers of aluminum. Our local supply of bauxite is from Arkansas, the biggest import coming from Dutch Guiana.

The Nebraska Council of Geography Teachers sponsored in October a series of programs devoted to geography in conjunction with sectional meetings of the Nebraska State Teachers Convention. Among the speakers were Professors E. E. Lackey and Ralph Olson of the University of Nebraska. The Council has resumed publication of its bulletin, with Miss B. Casper, Lincoln, Nebraska, serving as editor.

The New York Geographical Association reports a well-attended and successful meeting, held October 12, at the University of Rochester. The next meeting will be held at Oswego, with Isabelle K. Hart as chairman and Melvina Svec as secretary.

The Educational Relations Committee, headed by Erna Grassmuck Gilland, arranged for three sectional meetings devoted to geography, held in conjunction with the National Education Association Convention, held last July in Milwaukee. The discussions centered around the themes: New Frontiers in Secondary Education, and Geographic Learnings that Contribute to Education and Economic Well-being in our Democracy.

If you are looking for useful information about aviation and for teaching suggestions on the use thereof, send for the "Teacher's Manual of Aviation Aids." The Kit is nominal in cost and may be secured from United Air Lines, United Air Lines Building, Clearing Station, Chicago, Illinois

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Five thousand years from now, people will know what our age was like if the Time Capsule, which was buried in the World's Fair Grounds, September 23, is brought to light and its contents interpreted. Listed among the contents of the Time Capsule are a 10,000,000 word account of twentieth century civilization; letters for the occasion by Einstein, Millikan, Mann, and Whalen; a thousand pictures; a microfilm; a newsreel; a group of articles in common use; and a key to the use of the English language. Every effort was made to insure the Capsule and its contents against deterioration. Two thousand copies of a book entitled, "Book of Record of the Time Capsule," have been distributed to libraries and museums to guide future historians for finding the Capsule and interpreting its contents. The site of the Capsule is 40° 44′ 34.089″ N. and 73° 50′ 43.842″ W.

According to a recent release from the Bureau of Mines, the aquisition of French Lorraine iron ore deposits has given Germany a possible annual output of 60 million tons, thru a period of over 115 years. These ores are low in iron content (some 30 per cent) and contain lime but no silica, and are therefore among the cheapest ores to smelt. Owing to low cost of production, these ores can compete successfully upon a price basis, delivered to west German smelters, with the best-grade Swedish ores. In addition, these ores are near the Saar coal field and the Saar smelters.

The United States Forest Service reports that parachute jumping to forest fires, especially in inaccessible back country, has saved thousands of dollars in fire fighting costs. Airplane transport cuts hours of travel to minutes, enabling the forest fire fighter to get to a fire while it is small. Special clothing protects the jumper on landings and with his pocket-size short wave radio he communicates with the plane pilot or headquarters. The plane pilot drops tools and food on a small burlap chute. Now at the successful end of the first working season, the Service hopes to expand its parachute forces next year.

A mechanical corn picker is not just a labor saver, but it is a labor balancer which helps speed up the harvest to match the speed up in planting and cultivating. For instance, an efficient man using horses and a single row cultivator and other crop equipment can grow 35-40 acres of corn and husk it without additional labor. If he uses larger teams and a two-row cultivator he can grow 60 acres of corn, but this is almost twice what he can husk in six weeks. If he uses a general purpose tractor he can care for 125 acres which may require four men at husking and teams to haul the husking wagons, altogether a serious labor problem. This in brief explains the farmers' interest in the mechanical corn picker.

DR. SIDMAN P. POOLE, of the Department of Geology and Geography, Syracuse University, has been called to Washington in the Intelligence section of the General Staff of the United States Army, with the rank of Major. Dr. Poole served overseas with the American Expeditionary forces in the 309th Field Artillery during the World War. While at Syracuse he was a member of the 1930 University exploring expedition in Venezuela, and directed the Yucatan expedition in 1938. When the call to service came, he was planning another expedition to Yucatan and the land of the Mayas during the coming winter and spring. JOURNAL readers will remember his articles on the Site of Syracuse and on the Landscape Pattern of Ancient Brittany.

Word has just come of the untimely death last July of E. Ray Casto of Emory and Henry College. Professor Casto was a frequent contributor to the JOURNAL. He wrote several articles on Palestine and furnished a number of interest-stimulating devices, the latest of which appeared in November. Woodrow Flanary now heads the geography department of the College which Professor Casto so ably served.

DR. PRESTON JAMES of the geography department of the University of Michigan spoke on "The Place of Geography in the Social Studies Curriculum" at the annual meeting of Social Studies Teachers held at Syracuse, New York, November 21-23. Dr. J. Russell Whitaker of George Peabody College for Teachers was the discussion leader at the same meeting.

A wide range of information concerning railroads is embodied in a 64-page illustrated booklet called "Quiz," recently issued for free distribution by the Association of

American Railroads. The questions and answers bring out facts about the railway industry, its organization, history, size, operations, achievements, and the services it renders. Other types of questions reveal some of the color and romance of the story of transportation, and such items as the cost of air-conditioning a passenger car, and the location of the longest tunnel and longest bridge. Superintendents and teachers may get a copy by writing to the nearest of these addresses: The Association of American Railroads, Transportation Building, Washington, D.C.; or to Western Railways Committee on Public Relations, 105 West Adams Street, Chicago, Illinois; or to Eastern Committee on Public Relations, 143 Liberty Street, New York.

According to a release from FREC, fourteen Latin American countries have signified their intention of cooperating with Columbia's American School of the Air. They will help furnish material about their countries for use in the broadcasts.

Some time ago, in the JOURNAL's Editorial Notes and News, brief references were made to the Canadian government project of buying Alaskan reindeer and driving them to the Arctic feeding grounds of the MacKenzie River region. This was done to provide the Eskimos with another way of making a living, in addition to that derived from their cariboo herds. These imported reindeer and their offspring now total about 6,000 head. The main herd is on Richards Island in the MacKenzie river mouth, under government inspection. This herd is being subdivided into smaller herds to be cared for by Eskimos trained in their care. The first of these herds numbering 950 head was turned over to an Eskimo herder two years ago. It now numbers 1,600 head. This fall, the second graduate Eskimo herder was allotted 800 animals which are to be driven 250 miles overland from the main government herd. The agreement between government and herder is that the herder must return to the government as many head as he received, leaving the herder entitled to the increase. This gives an incentive to keep the herds in a healthy state to give a maximum increase, thus insuring food and clothing to the herder. So far, most sales of meat go to the mining camps, mission centers, and other outposts of civilization.

Progress is being reported in the construction of various links in the proposed transcontinental railway between Arica, Chile, and Santos, Brazil, via Corumbá, Brazil, and Santa Cruz, Bolivia. The latter link is expected to be finished in five years.

Foreign Commerce Weekly reports steady progress in the vast hydroelectric project on the Yalu River which forms part of the boundary between Chosen and Manchukuo. The plan calls for seven dams, the largest of which, the Suiho, will rival Boulder Dam in its storage capacity.

There are three services a week on the newly-opened railway betwewen Baghdad and Haidar Pasha (Istanbul). A few well-known cities on this route are Mosul, Alep, Adana, and Ankara. Standard gauge is used. Unfortunately, the rail link between this railway and that between Baghdad and Basra, Persian Gulf Port, is a meter gauge, thus necessitating loading and reloading at Baghdad.

Chemurgy is a relatively new word some of you may wish to add to your vocabulary. It refers to the research which is directed to develop new industrial uses for farm products, thus relieving the distress of farmers lacking markets for surplus crops. The research aims to inventory the chemical elements in crops, find out how they may be extracted and then recombined to produce totally different products. Examples are

found in the vast array of industrial products derived from such plants as soy beans, corn, cotton, and sweet potatoes. To aid this research the United States Department of Agriculture has set up several regional research laboratories. Some new uses for alfalfa leaves may be soon forthcoming in the field of plastics, dyes, and glues.

The use of Venetian blinds in the form of reed curtains dates back to ancient Egypt. Colonial America used them, and in one of George Washington's inventories is the item, "V. Blinds." Only recently, due to factory production of an excellent construction and variety of form, our standardization in window size, and the modern trend in home and office furnishings, has the industry of making Venetian blinds run into the millions of dollars. The Forest Products Laboratory at Madison, Wisconsin, is investigating methods of treating wood and finding which species of trees are best adapted to slat making. So far, among the best, are basswood, Port Orford cedar, incense cedar, ponderosa pine, magnolia, yellow poplar, western red cedar and hemlock, and California redwood.

GEOGRAPHICAL PUBLICATIONS

William H. Hartley. **Selected Films for American History and Problems.** 275 pp. Bureau of Publications, Teachers College, Columbia University, New York. 1940. $2.25

Many a social studies teacher may at one time have been bitten with an enthusiasm for motion pictures as an aid to teaching, only to have become disillusioned because of difficulties encountered and carrying thru an effective program. One such difficulty has been the lack of frankness on the part of distributing agencies in rating films correctly. That good films have been and are being produced no one will deny, but until recently few aids have been available to assist the teacher in sifting the good from the mediocre.

One such aid is now at hand in the handbook prepared by Mr. Hartley of Columbia University. The main function of this volume is to place in the hands of the teacher a catalog of the better 16 mm. films. Over six hundred 16 mm. films were evaluated by the author assisted by committees of teachers and students. Only two hundred of these were regarded as worthy of inclusion in the catalog. These in turn were subjected to a rating and classified as fair, good, or excellent—always with suitability to particular grade levels mentioned. A brief description accompanies each film, enabling the teacher to know more precisely the nature of the material treated and the manner of treatment.

Exceptionally high standards have been employed in film evaluations and the handbook deserves a wide distribution. Continued worth of the volume is, of course, dependent upon frequency of revision. The present volume deals with films prior to 1940.

THEODORE L. NYDAHL

State Teachers College
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E. L. Thorndike. **144 Smaller Cities.** 135 pp. Harcourt, Brace and Company, New York, 1940. $1.50

Dr. Thorndike presents this book as a companion volume to *Your City* (Reviewed in the JOURNAL: Vol. XXXVIII, No. 9, Dec., 1939, p. 376). The earlier book was a study of the cities of the United States with a population of 30,000 or over, and this later volume carries the presentation further by using cities with a population from 20,000 to 30,000.

The general goodness (G score) of the cities over 30,000 was based on thirty-seven items, while the scores of the smaller cities use twenty-four (five are items of health,

six of education, three of economic and social concerns, five of creature comforts, and five of miscellaneous values). In order that comparisons may be readily available, the smaller cities are scored also, as far as it is possible to do so, on the basis of the larger cities. In addition to the actual tabulation of the results of the investigations and research, discussions of the tables are added in three chapters, namely, "Improving a City," "What Makes a Small City Good?" and "A Few Suggestions for a Small City."

In the 1930 census, there were 159 cities in the United States with a population between 20,000 and 30,000. For fifteen of these cities the author was unable to obtain sufficient data to include in the study. For the 144 cities, the book contains materials of far reaching and fairly permanent worth. With this presentation as a background, it should be relatively an easy task for any of the communities to lay out a plan for the betterment of their city, particularly along the line of its improvement of life for themselves and their children.

The study should be interesting and valuable to teachers of sociology and civics, and students of urban geography, who have been content in the main to present locational facts or historical changes, might find in these books suggestions for deeper and more vital investigations.

ROBERT M. BROWN

Rhode Island College of Education

Parker, Margaret Terrell. **Lowell: A Study of Industrial Development.** 223 pp., 28 maps and figures. The Macmillan Company, New York, 1940. $2.25

The purpose of the author is "to portray the city (Lowell) as it is today, to analyze the environmental factors involved in its evolution to its present status, and to consider problems which its future development presents." These objectives have been attained. The material represents a portion of a larger study and presumably has been modified somewhat for purposes of publication. Since it was submitted as a Ph.D. thesis in the field of geography one would naturally expect to find its scope well within this field. However, it departs here and there to engage in purely economic, social, or other phases of the local activities and, therefore, any reader interested in seeking the geographic will do well to bear this in mind. The author has wisely assigned a sub-title which permits as much deviation from the geographical as serves her purpose.

The treatise is well documented and supported by evidence gained from direct observation. It reveals the story of the rise and decline of one of America's smaller industrial centers and attempts to find a solution to the problem of replacing, with a high degree of stability, the more or less precarious position of its remaining population. The environmental factor is emphasized thruout. The book is illustrated with interesting photographs and maps.

EUGENE VAN CLEEF

Ohio State University

J. Russell Smith and M. Ogden Phillips. **North America. Its People and the Resources, Development, and Prospects of the Continent as the Home of Man.** 1,008 pp., 238 charts, diagrams, and maps, 301 photographs, appendix, index. Harcourt, Brace and Company, New York, 1940. List Price, $4.75.

To one familiar with the 1925 edition of J. Russell Smith's North America it will be evident that this revised college textbook retains most of the features of the old edition. It is organized on the same regional basis, "the human-use region." In many cases, however, it is clear that these regions have been delineated on the basis of physio-

graphic divisions rather than on specific or dominant human-use characteristics. No great North American manufacturing region or regions, for example, are distinguished, a fact which many will regret. It retains the same lively style of writing which makes it entertaining for students to read.

Among the helpful new features of the revised edition are the small region-locating maps of a silhouette type at the beginning of each chapter. The new book has many more maps, charts, and diagrams showing distribution and quantitative changes of crops and products, particularly for the United States. These are largely taken from a great variety of authentic government sources. This means that the statistical data are as up to date as was possible before the data of the 1940 census were available. The maps also carry out the same entertaining feature as the style of writing with such a map as a "New Yorker's Idea of the United States" included. There are likewise aids to understanding the natural conditions in the form of a few physiographic cross-sections, precipitation and temperature data (very helpful in the appendix), and the like. There are many excellent pictures, unfortunately, however, not tied into the textbook material and so readily overlooked by the student unless carefully directed in their use by the instructor.

The major change in the text is in the approach to the study of the geography of North America as brought out in the first chapter which is entirely new. The emphasis is put on the problems confronting the United States in the use of our resources. There is a depressing note concerning the misuse of our lands and waters in the past with the hope expressed for better planning for future use. Within the text, too, there are evidences of this point of view, as for example, the treatment of the "dust bowl" on page 496. The last chapter, also new, presents the "Trade and Future of North America" with the opinions of the authors for what we need on this continent.

The amazing amount of material contained in the book makes it a valuable contribution readily available to the student of the geography of North America.

EDNA E. EISEN

Kent State University

George T. Renner and William H. Hartley. **Conservation and Citizenship.** 367 pp. 108 illustrations. D. C. Heath and Company, Boston, 1940. $1.86

Conservation and Citizenship, a book for high school level, contains nine units, namely: What is Conservation?; The United States as a Property; Our Forests—Mine or Crop?; Our Prodigal Waste of Soil; Water, Friend or Foe; Our Vanishing Wildlife; Squandering Our Mineral Wealth; Our Human Resources; and America Discovers Planning.

Each unit starts with a well-chosen half-page picture below which is listed three short definite aims. The next page is devoted to listing introductory activities. The textual content follows and the unit ends with ample provision for exercises and activities. For the teacher, the best part of the book is that devoted to practical exercises and activities which includes most types of visual education.

Appendix A, Motion Pictures, contains a large list of films for each unit with shipping address and cost. Appendix B, Books to Read, contains a list of books which seem more appropriate for college students. Names of popular books written for the high school level are conspicuously absent.

It is the best high school text I have reviewed on conservation. The citizenship part of the book appears to be an afterthought. The book and its worthy cause, conservation, is weakened by the antagonistic almost bitter attitude the authors take toward past use of resources. Too much emphasis is placed on the past and present situation rather than on remedial measures and what has and is being done to bring about desirable restoration.

THOMAS F. BARTON

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